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I/M (Inspection/Maintenance) New Technology Vehicle Testing Support Contract

EG and G Automotive Research, Inc.
Alexandria, VA

Prepared for

Environmental Protection Branch, Ann Arbor, MI

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FINAL REPORT

I/M NEW TECHNOLOGY VEHICLE TESTING SUPPORT CONTRACT

EPA Contract No. 68-03-3222

Task Assignment 1-1

October 1985

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The purpose of this report was to determine the causes of high in-use emissions for 1981 and newer passenger car vehicles. The Virginia Testing Laboratory (VTL) of EG & G Automotive Research Inc. was to procure 100 1981 or newer vehicles (but no 1983 or 1984 model year Chrysler vehicles equipped with 2.2. liter fuel injected engines and automatic transmissions). The VTL subjected each vehicle to an initial idle screening and inspection and based on the results, to an Federal test procedure(FTP) and various short cycle tests. The vehicle then received corrective maintenance, reinspection at a Maryland I/M station, and a second sequence of tests. Of the 91 cars tested in this program, 88 passed the Maryland standard of 1.2 percent carbon monoxide (CO) and 220 ppm Hydrocarbon (HC) after the first series of repairs, two cars required a second set of repairs (i.e., new catalysts) to pass, and time ran out before the one remaining car could be repaired to pass.

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FINAL REPORT

October 1985

EPA Contract 68-03-3222

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FINAL REPORT
WORK ASSIGNMENT #1, CONTRACT #68-03-3222
MARYLAND NEW TECHNOLOGY TESTING

Introduction

The purpose of Work Assignment #1 was to determine the causes of high in-use emissions for 1981 and newer passenger car vehicles. Specifically, the Virginia Testing Laboratory (VTL) of EG&G Automotive Research Inc. was to procure 100 1981 or newer vehicles (but no 1983 or 1984 model year Chrysler vehicles equipped with 2.2 liter fuel injected engines and automatic transmissions). The VTL subjected each vehicle to an initial idle screening and inspection and, based on the results, to an FTP and various short cycle tests. The vehicle then received corrective maintenance, reinspection at a Maryland I/M Station, and a second sequence of tests. Of the 91 cars tested in this program, 88 passed the Maryland standard of 1.2 percent CO and 220 ppm HC after the first series of repairs, two (2) cars required a second set of repairs (i.e., new catalysts) to pass, and time ran out before the one (1) remaining car could be repaired to pass.

Procurement

The VTL procured vehicles that failed the Maryland I/M idle emissions standards of 1.2% CO or 220 ppm HC at stations #7 and #8. I/M station personnel gave the drivers of all failing 1981 and newer vehicles a letter stating the purpose of the program and inviting them to call the lab if they wished to participate. At the same time, the Maryland Division of Motor Vehicles forwarded lists of I/M failures at stations #7 and #8 to the VTL. At first, these lists were sent via Purolator Courier Service. Shortly after procurement began the VTL suggested that the lists be sent via certified mail, in the interest of efficiency. The Project Officer agreed, and this method of shipment was used to the end of the work assignment.

The next step in the procurement process was contacting the owners. Procurement clerks used various directories to determine owner telephone numbers; if no number was found, a letter was mailed. If VTL personnel were unable, within two weeks, to contact the owners, their names were dropped from the list of eligible candidates.

After contacting the vehicle owners, procurement clerks asked pertinent questions regarding the vehicles and gave the vehicle owners further information on the selection process. Vehicles were eliminated from the program if, prior to delivery to the VTL, they were repaired following the initial inspection failure, were granted a waiver, or were reinspected. The owners were told that they would be called at a later date regarding final eligibility.

Random procurement was ensured by the use of a random number generator in a Hewlett-Packard 9825A computer. Whenever an excess of eligible candidates existed, a computer generated list of random numbers was used as the basis for selecting among them. If any selected candidate declined to participate, the next candidate dictated by the random number list was provided with the opportunity to participate.

On each Monday during the course of the task the list of cooperative vehicle owners, identified the week before, was compiled. By using the random number generator program the vehicles from that list were selected to fill the upcoming week's available test slots. Thus, depending on the number of cooperative owners and the number of available test slots, all the candidates from that week could be selected or only a small percentage.

Once the car was brought to the VTL it was subjected to an initial idle screening test. Any vehicle with emissions less than or equal to 0.7% CO and 120 ppm HC that exhibited no overt mechanical problem which might be the cause of high idle emissions was rejected for testing.

The idle test was performed on a fully warmed-up car, using an EPA-75 Sun machine. An electronic span of the instrument was performed by the mechanic. Then, prior to insertion of the tailpipe probe, a span using CO and HC gas cylinders was performed by the mechanic. The tailpipe probe was then inserted and the engine speed was increased to 2500 $\pm$ 300 rpm. Readings were taken when the strip chart stabilized or at 30 seconds, whichever occured first. The engine was then allowed to idle and readings were taken in a similar manner. The electronic and gas cylinder spans were repeated following the exhaust readings.

Each potential participant was offered the following incentives to take part in the program:

- The use of a late model, fully fueled, and insured loaner vehicle during the time the participant's vehicle was being tested.

- A full tank of gasoline in the participant's vehicle when returned to the owner.

- $100.00 in cash or check.

- Free repair and documentation of a passing inspection at a Maryland I/M Station (In one case a waiver was obtained because there was not sufficient time remaining on the work assignment to complete the repairs).

- $20.00 in cash or check for each delivery or pick-up of the test vehicle by the owner.*

Those participants whose vehicles passed the idle screening or were rejected for other reasons (driveability problems or other defects which would make testing difficult) received a $25.00 incentive and a full tank of gas. In instances where a first test had been completed, the vehicle owners received the full $100.00 plus a waiver for their car.

The number of acceptable vehicles procured was 91; the number of vehicles rejected after delivery to the lab was 68. Table 3 summarizes the rejections. In addition, five cars were rejected after a single valid FTP was performed; Table 4 summarizes these rejections.

Vehicle Testing

On each vehicle accepted for testing, the VTL performed no more than three sequences of testing; most vehicles received two tests. Each test sequence consisted of the Federal Test Procedure (FTP) for exhaust emissions only. In addition, two short cycle tests were performed, the Four Mode Idle Test (reference: CFR 40, July 1, 1985, 85.2213) and the Engine Restart Idle Test (reference: CFR 40, July 1, 1985, 85.2210).

The Four Mode Idle Test procedure follows a 505 second precondition cycle and a soak time of one to six minutes. The vehicle is placed in neutral, a tachometer is connected to the engine, and the tailpipe probe is inserted. After an initial zero and span of the instrument, the raw exhaust is analyzed with the engine idling. The DVM and meter readings are taken when the trace stabilizes or at thirty seconds, whichever comes first. The engine speed is then increased to 2500 $\pm$ 300 rpm, and meter readings are taken as in the first mode. In the third mode the engine speed is returned to idle, and DVM and meter readings are likewise taken. If the vehicle has an automatic transmission it

* NOTE: The $20.00 incentive was dropped in March of 1985, because the number of willing participants was high and because most of the owners found it more convenient to drop their vehicle off. Also, many owners wanted to observe the operation of the lab.

is placed in drive, and DVM and meter readings are taken as in the other modes. The engine speed is recorded for all phases.

The Engine Restart Idle Test usually follows the Four Mode Idle Test, and, in such cases the instrument span and zero are performed at the end of this second test. In any case, a span and zero are performed following the last raw exhaust test.

The Engine Restart Idle Test follows the Four Mode Idle Test or a 505 second precondition cycle after a soak time of one to six minutes. During this test, the vehicle is placed in neutral, a tachometer is connected to the engine, and the tailpipe probe is inseted. The engine is turned off and then immediately re-started, using the appropriate hot-start procedure. DVM and meter readings are taken when stabilized or at 30 seconds, whichever comes first. The vehicle speed is then increased to 2500 $\pm$ 300 rpm, and DVM and meter readings are taken as during the first phase. The instrument is then zeroed and spanned.

Table 1 lists the composite FTP emissions, the emissions from the second idle of the Four Mode Idle Test, and the emissions from the idle mode of the Restart Idle Test. Note that "EMISSIONS" in the odometer column indicates that the service flag was up on the car's odometer.

Maintenance

Maintenance involved, first, a non-altering and complete inspection of the vehicle's emission components. The findings of this inspection were recorded on coded data sheets. The purpose of this inspection was to identify the causes of excess emissions in the test vehicle. The second maintenance sequence was an attempt at actual repair of the vehicle. The mechanics performed repairs systematically, the primary goal being to reduce idle HC and CO emissions. These repairs were performed after the first sequence of testing. In five cases, however, defects which would have made testing difficult or impossible were corrected before the first sequence of testing. To prevent contamination of laboratory air, the mufflers and exhaust pipes were replaced on vehicles IM6/0045, IM7/0143, and IM8/0184; the muffler alone was replaced on IM8/0140. The ignition module and idle mixture limiting device were replaced in vehicle IM6/0054 to alleviate stalling problems.

With the approval of the Project Officer, VTL performed third sequence tests on cars with emissions greater than 0.82 g/mile HC or 6.8 g/mile CO (or 14.0 g/mile CO for the 7.0 g/mile standard) based on the combined results of phase 2 and phase 3 of the FTP (i.e., a hot LA-4), or whenever significant emission control problems remained after testing. The maintenance for the third sequence of testing followed the same course as that for

second sequence tests. Table #2 shows the labor hours required for repairs, costs of parts (broken down between 3-way system parts and other parts), and provides a brief description of repairs and adjustments performed for the corresponding sequence of testing.

Table of Vehicle Identification Information

and

Results of the FTP, 4 Mode Idle Test, and Restart Idle Test

TABLE #1

								FTP					4 MODE IDLE TEST				RESTART IDLE TEST			
VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	HC	CO	NOI	CO2	CH4	HC	CO	NO	CO2	HC	CO	NO	CO2
IM5/0002	1G1AB6897BY282316	1981	CHEVROLET	CHEVETTE	98	41337	05-Mar-85	1	1.0500	12.5400	0.3830	338.10	0.1050	55.0	0.09	0.00	12.3510	35.00	0.0500	0.00	12.1470
						41403	14-Mar-85	2	0.8490	11.8680	0.3690	345.00	0.0940	20.0	0.04	5.00	32.7800	10.00	0.0200	40.00	3.4390
IM5/0005	1G1AT69E6BB430716	1981	CHEVROLET	MALIBU	229	15833	14-Mar-85	1	6.2720	165.6310	0.4300	307.10	0.5680	140.0	2.00	0.00	2.2400	138.00	1.9500	0.00	2.1960
						15923	05-Apr-85	2	1.4560	10.9820	1.7440	442.30	0.1040	25.0	0.05	10.00	14.6800	50.00	0.1000	20.00	14.6800
IM5/0006	1G1AB6894BY108803	1981	CHEVROLET	CHEVETTE	98	62280	22-Mar-85	1	3.6790	74.4820	0.5530	256.10	0.3450	285.0	7.95	2.00	10.1870	280.00	7.6000	1.00	10.2440
						62350	03-Apr-85	2	0.4180	3.1610	1.7870	326.80	0.0510	10.0	0.02	74.00	14.6500	10.00	0.0200	81.00	14.5170
IM5/0009	1G3AE6955BW195424	1981	OLDSMOBILE	OMEGA	151	57472	23-Apr-85	1	0.3210	3.6020	3.3090	389.30	0.0390	10.0	0.02	31.00	8.7350	20.00	0.0500	52.00	14.7910
						57529	30-Apr-85	2	0.2570	2.1090	3.1690	397.90	0.0360	10.0	0.02	38.00	8.8310	11.00	0.0200	32.00	8.8310
IM5/0012	1G1AB6893BA165731	1981	CHEVROLET	CHEVETTE	98	87515	01-May-85	1	0.8380	9.0180	0.9720	303.90	0.0740	300.0	0.08	3.00	13.0980	265.00	0.0800	1.00	12.9090
						87578	09-May-85	2	0.4180	8.1060	0.4890	322.90	0.0640	8.0	0.04	3.00	13.5000	8.00	0.0400	5.00	13.5430
IM5/0013	1G1AB8893BY335428	1981	CHEVROLET	CHEVETTE	98	54981	03-May-85	1	1.6640	51.8850	0.3560	314.20	0.1310	130.0	1.60	13.00	13.5640	140.00	1.2500	35.00	13.8640
						55057	22-May-85	2	1.0690	33.2630	0.2270	316.50	0.1010	5.0	0.04	76.00	13.9280	5.00	0.0400	71.00	13.8630
						55080	29-May-85	3	0.2410	5.5650	0.4010	353.30	0.0500	5.0	0.02	82.00	14.1000	9.00	0.0200	56.00	13.0780
IM5/0015	1G3AR472BM528943	1981	OLDSMOBILE	CUTLASS	231	66645	24-May-85	1	0.6100	12.2370	0.7040	442.60	0.0700	70.0	0.65	36.00	13.4790	10.00	0.7500	22.00	13.5210
						66703	30-May-85	2	0.4990	10.5910	0.8110	448.50	0.0650	35.0	0.60	26.00	13.4150	70.00	0.6000	14.00	13.3310
IM5/0018	1G6AD6993B9233286	1981	CADILLAC	DEVILLE	366	44374	29-May-85	1	3.3210	121.1340	0.7690	576.00	0.3130	100.0	2.50	59.00	13.2250	70.00	2.5000	134.00	13.4360
						44483	20-Jun-85	2	0.7700	24.5640	0.8670	715.40	0.1450	11.0	0.04	50.00	14.1410	12.00	0.0400	54.00	14.1200
						44515	28-Jun-85	3	0.8710	27.7100	0.9730	687.80	0.1370	18.0	0.02	94.00	13.9690	12.00	0.0200	54.00	14.1850
IM5/0019	1G1AN69E2BD504936	1981	CHEVROLET	MALIBU	229	69096	30-May-85	1	5.2250	144.8990	0.2040	333.70	0.7850	440.0	7.60	2.00	10.3470	440.00	6.9000	1.00	10.6320
						69159	05-Jun-85	2	0.3210	5.1400	0.5970	435.30	0.0610	10.0	0.05	4.00	14.8000	7.00	0.0500	103.00	14.7560
IM5/0022	1G1AT27E9BB442841	1981	CHEVROLET	MALIBU	229	62529	04-Jun-85	1	2.4500	21.5450	1.9870	441.60	0.1620	250.0	0.80	16.00	14.3390	330.00	0.5000	24.00	14.3170
						62589	11-Jun-85	2	2.6570	20.2570	1.5950	447.50	N/A	50.0	0.05	52.00	14.7780	60.00	0.0500	66.00	14.5580
						62614	20-Jun-85	3	2.6950	22.1650	1.5630	441.10	0.1630	220.0	0.40	9.00	14.6640	190.00	0.2000	4.00	14.7740
IM5/0023	2G2AJ37A9B2530538	1981	PONTIAC	GRAND PRIX	231	55702	04-Jun-85	1	3.0550	34.6710	2.4100	417.50	0.1570	480.0	1.70	60.00	12.9110	380.00	1.7000	54.00	13.4150
						55763	12-Jun-85	2	2.7430	26.9020	2.4840	416.60	0.1140	325.0	0.70	66.00	13.2040	380.00	0.8000	65.00	13.3310
IM5/0027	1G1AB6892BY160639	1981	CHEVROLET	CHEVETTE	98	58287	18-Jun-85	1	0.3910	6.1580	0.9970	306.40	0.0580	50.0	0.10	2.00	12.6860	20.00	0.0800	1.00	13.8190
						58347	21-Jun-85	2	0.3720	5.0230	0.9010	310.00	0.0530	5.0	0.02	16.00	13.6700	5.00	0.0300	17.00	13.6700
IM5/0028	1G1AB6890BA245343	1981	CHEVROLET	CHEVETTE	98	EMISSION	20-Jun-85	1	1.5560	20.9950	0.2960	325.30	0.0970	220.0	0.20	2.00	14.7960	185.00	0.4000	4.00	14.7300
						EMISSION	26-Jun-85	2	0.3760	5.8840	0.3230	344.50	0.0600	5.0	0.03	127.00	13.6490	5.00	0.0300	97.00	13.5850
IM5/0029	2G2AH37A9B1731236	1981	PONTIAC	BONNEVILLE	231	71004	27-Jun-85	1	9.6850	209.7470	0.7840	313.60	1.1360	450.0	8.40	21.00	9.2840	495.00	8.6000	22.00	8.6260
						71120	11-Jul-85	2	4.3450	29.2620	2.5430	447.40	0.1320	600.0	1.40	51.00	12.8920	500.00	1.4000	48.00	13.2890
						71146	12-Jul-85	3	0.7600	10.9210	0.8920	475.00	0.1090	50.0	0.15	2.00	14.5110	20.00	0.1200	0.00	14.5330
IM5/0030	1G1AN69H0BJ272142	1981	CHEVROLET	CAPRICE	305	58861	27-Jun-85	1	0.5510	12.4180	0.5190	536.70	0.0850	30.0	0.40	1.00	14.7520	50.00	1.1000	2.00	14.3580
						58922	03-Jul-85	2	0.2740	7.3230	0.6980	568.10	0.0520	5.0	0.03	59.00	13.4580	5.00	0.0300	50.00	13.1840
IM5/0033	1G4AC69I5B7145739	1981	BUICK	SKYLARK	171	54758	27-Jun-85	1	0.5410	10.1930	0.6470	419.10	0.1460	30.0	0.65	34.00	13.9480	45.00	0.7500	35.00	13.8620

TABLE #1

VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	FTP HC	FTP CO	FTP NOX	FTP CO2	FTP CH4	4 MODE IDLE TEST HC	4 MODE IDLE TEST CO	4 MODE IDLE TEST NO	4 MODE IDLE TEST CO2	RESTART IDLE TEST HC	RESTART IDLE TEST CO	RESTART IDLE TEST NO	RESTART IDLE TEST CO2
						54620	03-Jul-85	2	0.3480	4.5430	0.6520	412.60	0.0920	15.0	0.03	18.00	12.7890	11.00	0.0300	31.00	12.9340
IH5/0037	1G1AB6891B4211032	1981	CHEVROLET	CHEVETTE	98	44978	03-Jul-85	1	0.7600	10.6770	0.4530	311.30	0.0770	200.0	0.20	1.00	>14.796	90.00	0.0700	1.00	>14.769
						45037	10-Jul-85	2	0.6160	11.4170	0.3330	313.90	0.0200	10.0	0.04	4.00	>14.796	5.00	0.0300	0.00	>14.796
IH5/0038	1G1AB6899BY261144	1981	CHEVROLET	CHEVETTE	98	27353	09-Jul-85	1	1.4410	33.7660	0.0973	308.10	0.1070	300.0	3.00	40.00	13.0170	260.00	4.6000	17.00	14.2500
	"	"	"	"	"	27444	18-Jul-85	2	0.8380	14.5600	1.0930	340.20	0.0740	35.0	0.05	143.00	14.1000	90.00	1.1000	49.00	14.4480
IH5/0040	1G1AJ0897BY269436	1981	CHEVROLET	CHEVETTE	98	44024	05-Jul-85	1	0.2490	5.2270	0.5600	328.10	0.0440	5.0	0.03	60.00	>14.716	8.00	0.0400	60.00	14.7520
	"	"	"	"	"	44085	11-Jul-85	2	0.3010	5.3520	0.5800	310.20	0.0520	20.0	0.04	0.00	14.7960	10.00	0.0200	0.00	14.7960
IH5/0041	1G2AF35A5BB102993	1981	PONTIAC	LE MANS	231	41085	10-Jul-85	1	1.5340	20.5300	0.0636	478.90	0.1290	50.0	0.60	19.00	14.2930	60.00	1.0000	13.00	14.1850
						41157	25-Jul-85	2	0.8310	14.6630	0.6730	474.40	0.0920	20.0	0.28	5.00	14.6020	10.00	0.2000	1.00	14.6680
IH5/0044	1G1AB6897BY332843	1981	CHEVROLET	CHEVETTE	98	EMISSION	30-Jul-85	1	0.6200	9.8000	0.8330	349.20	0.1080	250.0	3.30	6.00	12.9740	235.00	3.2300	9.00	12.9110
						EMISSION	01-Aug-85	2	0.3190	5.4120	0.7070	363.30	0.0530	8.0	0.04	98.00	13.7340	15.00	0.0400	91.00	13.5850
IH5/0048	1G1AL69J4BJ166750	1981	CHEVROLET	IMPALA	267	38767	08-Aug-85	1	1.6940	40.5010	1.0840	415.20	0.2400	245.0	2.90	16.00	12.7240	40.00	0.5500	8.00	14.6020
						38826	20-Aug-85	2	0.4270	9.2350	0.2950	486.20	0.0880	15.0	0.10	2.00	14.8050	30.00	0.2000	1.00	14.8050
IH5/0049	1G1AP07E3BL162642	1981	CHEVROLET	CAMARO	229	48505	21-Aug-85	1	1.2020	20.3160	0.4160	442.30	0.1130	35.0	0.08	9.00	14.8050	255.00	0.6000	2.00	14.3200
						48584	28-Aug-85	2	0.7040	12.5940	0.4740	452.60	0.0780	155.0	0.15	0.00	14.8050	200.00	0.5000	0.00	14.4520
IH5/0052	1G1A23750BB458163	1981	CHEVROLET	MONTE CARLO	267	99119	27-Aug-85	1	5.8820	57.1550	0.8980	432.50	0.3850	910.0	2.20	29.00	9.2800	250.00	2.1000	27.00	9.1350
						99219	21-Sep-85	2	4.7360	31.2970	1.1240	474.40	0.1420	1300.0	2.30	49.00	11.8080	1370.00	2.4000	49.00	11.7080
IH6/0001	JN1PB04SXB9240310	1981	DATSUN	210	91	57300	26-Feb-85	1	0.7760	12.4490	0.6480	296.60	0.1080	700.0	6.20	7.00	10.0730	650.00	6.7500	7.00	9.9610
						57366	07-Mar-85	2	0.3680	4.2200	0.8630	301.00	0.0840	30.0	0.02	42.00	9.0270	30.00	0.0400	45.00	8.9560
IH6/0004	1P3BL18BD274830	1981	PLYMOUTH	HORIZON	135	67765	08-Mar-85	1	2.2360	48.3090	1.1840	280.70	0.2520	150.0	3.40	5.00	5.2930 *	150.00	3.4000	5.00	5.3220
						67825	21-Mar-85	2	0.7650	8.3060	1.2200	357.20	0.2360	40.0	0.04	32.00	11.1870	20.00	0.0600	38.00	11.3250
IH6/0007	1FABP21A9GA151932	1981	FORD	FAIRMONT	140	64781	04-Apr-85	1	3.2300	95.5650	0.7280	306.70	0.2590	210.0	4.40	38.00	12.5510	220.00	3.8000	48.00	12.6130
						65842	13-Apr-85	2	0.7440	17.3210	0.5330	437.90	0.1880	20.0	0.08	29.00	10.2440	25.00	0.0600	29.00	10.0540
IH6/0008	JN1HB04S9BI404612	1981	NISSAN	TWO-EIGHTY ZX	168	45968	12-Apr-85	1	0.4930	5.9620	1.0920	465.90	0.0750	8.0	0.04	11.00	8.9500	12.00	0.0300	11.00	8.9140
						46029	18-Apr-85	2	0.3500	2.4300	1.4670	473.00	0.0580	15.0	0.03	25.00	9.0580	20.00	0.0300	22.00	8.8960
IH6/0014	1FABP21DXBK127627	1981	FORD	FUTURA	256	51033	10-May-85	1	0.4010	3.3730	2.3280	497.80	0.1420	5.0	0.03	29.00	9.4800	5.00	0.0300	25.00	9.5720
						51093	16-May-85	2	0.5700	3.7580	1.7770	502.40	0.1530	8.0	0.02	31.00	9.7540	8.00	0.0200	26.00	9.5720
IH6/0017	JN1PB03SBB021730	1981	DATSUN	310	91	105583	06-Jan-85	1	0.5960	8.0180	1.1210	289.30	0.1010	40.0	0.02	56.00	10.252	50.00	0.0300	52.00	10.3660
IH6/0036	1MEBP68AEBF648643	1981	MERCURY	CAPRI	140	67748	03-Jul-85	1	1.9220	41.0100	0.2620	426.80	0.3520	390.0	5.80	11.00	10.8130	370.00	6.0000	15.00	11.0260
						67807	12-Jul-85	2	1.2250	23.2870	0.2840	466.30	0.2260	110.0	1.60	5.00	14.1200	135.00	1.7000	18.00	13.8480
						67832	19-Jul-85	3	0.8070	20.4720	0.3150	423.80	0.1910	15.0	0.03	27.00	8.0940	20.00	0.0300	30.00	8.0250
IH6/0039	1P3BE21EXBC183648	1981	PLYMOUTH	RELIANT	135	35566	05-Jul-85	1	0.7730	10.2010	1.1330	378.40	0.2880	50.0	0.04	32.00	13.5640	50.00	0.0400	31.00	13.5000
						35635	11-Jul-85	2	0.5380	8.0880	1.0610	385.90	0.1530	35.0	0.03	36.00	11.9730	10.00	0.0200	35.00	11.7130

TABLE #1

									FTP					4 MODE IDLE TEST				RESTART IDLE TEST			
VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	HC	CO	NOI	CO2	CH4	HC	CO	NO	CO2	HC	CO	NO	CO2
IN6/0042	1B3BL18A2BD167041	1981	DODGE	OMNI	98	123847	12-Jul-85	1	1.8250	6.7470	1.4160	328.90	0.1110	400.0	0.03	30.00	7.9200	450.00	0.0200	31.00	7.9540
	No second sequence																				
IN6/0043	1FABP0823BT175554	1981	FORD	ESCORT	98	48482	30-Jul-85	1	6.3400	141.3970	0.5990	233.30	0.6830	330.0	6.30	14.00	3.9940	910.00	7.3000	8.00	3.4170
						48591	21-Aug-85	2	0.4460	5.6400	0.6570	354.90	0.1160	16.0	0.02	17.00	8.3350	10.00	0.0200	16.00	8.3520
IN6/0045	JT2TE72S5B0435653	1981	TOYOTA	COROLLA	108	47399	02-Aug-85	1	2.1530	49.2550	0.9090	271.10	0.1460	210.0	1.80	56.00	12.6830	220.00	1.7000	59.00	12.8700
						47605	22-Aug-85	2	0.3080	5.0120	0.5720	335.70	0.0440	5.0	0.03	33.00	13.5640	10.00	0.0400	27.00	13.4570
IN6/0046	2FABP38F9BB123351	1981	FORD	LTD	302	55359	07-Aug-85	1	4.5320	121.6000	0.6200	518.30	0.4560	1090.0	4.90	7.00	11.8480	275.00	5.0000	10.00	11.6480
						55513	22-Aug-85	2	1.5820	47.1830	0.3320	629.00	0.2570	15.0	0.06	27.00	12.0450	10.00	0.0200	50.00	11.9640
IN6/0051	1FABP12D2BF222362	1981	FORD	MUSTANG	252	52045	27-Aug-85	1	3.7190	37.1700	1.8480	398.10	0.2070	570.0	2.50	4.00	13.3720	580.00	2.2000	4.00	13.5000
						52135	04-Sep-85	2	0.6010	2.1160	2.0550	470.30	0.1170	20.0	0.01	73.00	10.6820	27.00	0.0100	74.00	10.6630
IN6/0053	1MEBP71B3BA614159	1981	MERCURY	ZEPHYR	200	57660	27-Aug-85	1	1.3220	10.5000	2.4680	421.30	0.1690	700.0	1.70	23.00	13.7140	750.00	1.7000	21.00	13.8210
						57762	13-Sep-85	2	0.5720	3.5340	2.0290	432.70	0.0800	100.0	0.04	83.00	14.1000	105.00	0.0400	73.00	13.9280
IN6/0054	1FABP10BSF195966	1981	FORD	MUSTANG	200	76442	14-Sep-85	1	2.6660	54.0410	0.8300	431.20	0.2550	200.0	2.30	56.00	13.4790	230.00	1.8000	57.00	13.4360
						76569	19-Sep-85	2	1.2520	21.7850	0.7670	483.90	0.1960	80.0	0.04	93.00	14.0790	80.00	0.0300	95.00	13.9490
IN6/0056	JH1PH0359BH010358	1981	DATSUN	310	92	85130	11-Sep-85	1	0.8600	12.5030	0.5780	334.60	0.1260	80.0	0.35	72.00	13.7990	90.00	0.4200	69.00	13.7990
						85209	18-Sep-85	2	2.4570	76.7620	1.2750	317.40	0.3030	120.0	0.18	133.00	12.5180	130.00	0.1900	135.00	12.7450
IN6/0057	1MEBP632IBT603051	1981	MERCURY	LYNX	98	70616	13-Sep-85	1	3.0390	44.6830	1.3310	298.30	0.1270	70.0	0.09	103.00	8.1970	170.00	0.1000	97.00	8.1970
						70677	20-Sep-85	2	4.0890	91.1600	0.5140	250.30	0.3450	80.0	0.06	104.00	8.0420	100.00	0.0600	104.00	8.0590
IN7/0101	2G3AM47A9C2338000	1982	OLDSMOBILE	CUTLASS	231	89018	22-Feb-85	1	2.0150	8.1940	1.2680	470.00	0.1000	270.0	0.20	8.00	13.6920	250.00	0.2000	9.00	13.6280
						89086	13-Mar-85	2	1.6350	5.9350	1.3610	467.40	0.0870	130.0	0.04	41.00	9.5900	140.00	0.0400	11.00	9.6890
						89146	02-Apr-85	3	0.2940	2.3900	0.5730	452.10	0.0420	15.0	0.05	1.00	14.2600	10.00	0.0700	2.00	14.2600
IN7/0102	2G3AE69A5C2402415	1982	OLDSMOBILE	CUTLASS	231	56927	27-Feb-85	1	0.6990	8.1270	4.0470	465.60	0.0700	600.0	0.50	6.00	14.3640	600.00	0.5000	6.00	14.3640
						57085	02-Apr-85	2	0.7930	8.4970	0.9900	419.30	0.0790	10.0	0.05	35.00	14.5680	10.00	0.0300	34.00	14.4580
IN7/0105	1G1AD27P1DJ124763	1983	CHEVROLET	CAVALIER	122	49038	04-Apr-85	1	0.2600	7.7600	0.3420	356.50	0.0540	10.0	0.03	23.00	6.0370	10.00	0.0300	39.00	7.3280
						49097	09-Apr-85	2	0.2140	5.7440	0.6660	360.20	0.0510	8.0	0.03	76.00	13.9970	10.00	0.0300	85.00	14.2380
IN7/0107	1G1AB06C4EY119913	1984	CHEVROLET	CHEVETTE	98	17023	02-Apr-85	1	0.2740	2.0550	0.6300	301.00	0.0700	5.0	0.03	25.00	10.2630	8.00	0.0300	24.00	9.9980
						17082	05-Apr-85	2	0.2230	1.4860	0.6870	302.60	0.0610	10.0	0.04	15.00	10.1110	10.00	0.0400	21.00	9.9980
IN7/0108	1G2AZ68C7EY216342	1984	PONTIAC	T-1000	98	11797	28-Mar-85	1	0.7680	5.7520	0.5760	314.70	0.1540	280.0	2.63	0.00	13.4790	250.00	2.2500	0.00	13.7370
						11856	04-Apr-85	2	0.4310	2.8540	0.5920	327.50	0.0990	15.0	0.03	13.00	9.6990	15.00	0.0300	10.00	9.6430
IN7/0109	1G4AT2708CE447418	1982	BUICK	SKYHAWK	110	40194	05-Apr-85	1	0.7110	8.7190	0.7870	313.70	0.0590	320.0	6.20	1.00	14.4360	250.00	8.0000	3.00	14.4800
						40255	11-Apr-85	2	0.3970	3.7470	0.9180	327.50	0.0390	8.0	0.04	4.00	14.6130	15.00	0.0500	2.00	14.6130
IN7/0114	1G1A306C9DY156215	1983	CHEVROLET	CHEVETTE	98	36876	10-Apr-85	1	2.1460	42.3270	0.4290	285.70	0.2050	20.0	0.04	10.00	10.8990	10.00	0.0400	17.00	10.6800
	No second sequence																				

TABLE #1

									FTP					4 MODE IDLE TEST				RESTART IDLE TEST			
VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	HC	CO	NOX	CO2	CH4	HC	CO	NO	CO2	HC	CO	NO	CO2
IM7/0115	1G6AD4786D9215107	1983	CADILLAC	DEVILLE	250	35628	16-Apr-85	1	0.5000	4.5470	0.4650	485.40	0.0590	75.0	0.10	1.00	14.1060	120.00	0.0900	6.00	14.1280
						35690	19-Apr-85	2	0.2810	1.9980	0.8010	489.60	0.0610	20.0	0.02	21.00	10.8010	20.00	0.0300	41.00	10.7430
IM7/0117	1G1AP0778DM132866	1983	CHEVROLET	CAMARO	151	60621	19-Apr-85	1	2.1080	5.2140	1.9610	403.90	0.1010	150.0	0.19	1.00	14.3470	220.00	0.1500	1.00	14.3250
						60686	24-Apr-85	2	1.6380	4.8430	1.7670	406.10	0.0940	150.0	0.19	1.00	14.3200	190.00	0.1000	1.00	14.2980
IM7/0124	1G2AC2708D7232442	1983	PONTIAC	J-2000	110	54264	26-Apr-85	1	0.8770	7.6030	0.6710	326.90	0.0670	75.0	0.60	3.00	14.5610	180.00	0.8000	1.00	14.4300
						54355	08-May-85	2	0.6000	4.1950	0.6660	339.10	0.0530	40.0	0.23	2.00	14.6060	30.00	0.3100	11.00	14.5170
IM7/0131	1G1AB35G2C7121472	1982	CHEVROLET	CAVALIER	110	62714	03-May-85	1	0.3780	5.2580	1.4500	415.50	0.0840	5.0	0.03	26.00	8.5480	8.00	0.0200	28.00	8.5130
						62795	14-May-85	2	0.3170	3.5470	1.4300	423.20	0.0750	6.0	0.01	43.00	8.4430	3.00	0.0200	35.00	8.5310
IM7/0135	1G1AB68C2CT102427	1982	CHEVROLET	CHEVETTE	98	38938	07-May-85	1	0.4260	8.6640	2.4110	339.20	0.0540	50.0	0.28	21.00	14.8050	50.00	0.1000	6.00	14.8050
						39005	15-May-85	2	0.4870	9.6740	0.6120	349.00	0.0630	20.0	0.10	1.00	14.8050	30.00	0.4000	0.00	14.8050
IM7/0137	1G2AE37A6CP512064	1982	PONTIAC	GRAN PRIX	231	42743	15-May-85	1	4.0770	24.1390	1.1840	425.30	0.1180	620.0	0.85	40.00	13.4360	650.00	0.7500	43.00	13.3940
						42814	07-Jun-85	2	3.6550	11.6430	1.4210	444.40	0.0670	570.0	0.23	48.00	13.4580	570.00	0.2800	47.00	13.4580
IM7/0143	1G1AC69P7DJ125245	1983	CHEVROLET	CAVALIER	122	35289	06-Jun-85	1	3.4610	50.1300	0.2990	344.60	0.3790	20.0	0.07	3.00	>14.800	20.00	0.0500	2.00	>14.800
						35356	14-Jun-85	2	1.0670	10.2300	0.3830	372.70	0.0860	10.0	0.04	6.00	>14.800	20.00	0.0400	6.00	14.6020
IM7/0148	2G3AR47A7C2308186	1982	OLDSMOBILE	CUTLASS	231	73064	07-Jun-85	1	1.7890	21.1430	1.3030	451.20	0.1150	680.0	0.65	18.00	14.3830	720.00	0.4900	9.00	14.4050
						73215	19-Jun-85	2	1.0510	10.5840	1.0040	457.70	0.0830	320.0	0.25	4.00	14.5760	230.00	0.2000	3.00	14.6200
IM7/0150	1G1AC35P607155564	1983	CHEVROLET	CAVALIER	122	30746	12-Jun-85	1	0.5000	8.3340	0.2600	389.30	0.0640	120.0	0.25	1.00	>14.800	180.00	6.0000	33.00	11.3710
						30804	14-Jun-85	2	0.2230	5.0350	0.2450	362.40	0.3040	10.0	0.02	60.00	14.6240	15.00	0.0200	4.00	>14.800
IM7/0153	1G1AM35E7CR157037	1982	CHEVROLET	MALIBU	229	51272	11-Jun-85	1	2.4230	10.9490	2.2500	452.00	0.0750	600.0	0.17	23.00	9.8410	500.00	0.1800	7.00	9.1110
						51423	21-Jun-85	2	2.0590	24.1980	2.4000	439.80	0.0930	175.0	0.30	80.00	13.9050	250.00	0.2500	58.00	13.6270
						51449	28-Jun-85	3	2.1390	24.5980	2.3950	432.00	0.0980	280.0	0.40	60.00	13.8190	200.00	0.2000	64.00	9.0680
IM7/0164	1G1AB68C3DY115935	1983	CHEVROLET	CHEVETTE	98	24590	11-Jul-85	1	0.7980	8.2780	0.6530	298.20	0.1310	290.0	3.40	1.00	12.7890	265.00	3.2000	0.00	12.9960
						24652	17-Jul-85	2	0.4500	3.5450	0.4990	338.50	0.1090	20.0	0.02	72.00	9.1470	20.00	0.0300	90.00	9.2010
IM7/0167	1G4AM69Y8CH433503	1982	BUICK	PARK AVENUE	301	69735	16-Jul-85	1	6.1700	30.5680	3.4310	505.70	0.1150	700.0	0.80	80.00	10.2520	450.00	0.2100	118.00	9.9890
	No second sequence																				
IM7/0169	1G1AJ08C6CT132405	1982	CHEVROLET	CHEVETTE	98	41566	17-Jul-85	1	4.6510	99.4470	0.5900	225.80	0.4490	200.0	3.10	65.00	12.6830	220.00	4.0000	60.00	12.4160
						41648	31-Jul-85	2	2.8520	56.3910	0.8390	243.60	0.2710	30.0	0.05	44.00	14.7560	30.00	0.0500	62.00	14.6680
IM7/0172	1G1AM69E0CR160181	1982	CHEVROLET	MALIBU	229	46370	27-Jul-85	1	1.3240	21.9970	1.0560	386.70	0.1210	285.0	2.80	11.00	13.0570	330.00	1.6000	23.00	13.8630
						46469	06-Aug-85	2	1.2940	22.6390	1.0150	401.70	0.1160	255.0	2.20	4.00	13.4580	230.00	1.4000	3.00	14.1000
						46484	08-Aug-85	3	0.7710	9.3590	1.1450	413.80	0.0750	50.0	0.10	3.00	>14.800	30.00	0.1400	63.00	9.7480
IM7/0201	1G1AX37E9CB100859	1982	CHEVROLET	MONTE CARLO	229	78522	17-Sep-85	1	5.5170	82.8840	0.9980	410.80	0.6360	1630.0	9.60	24.00	7.8560	880.00	9.3000	6.00	7.0770
	No second sequence																				
IN8/0103	1B3B218C7DD105976	1983	DODGE	OMNI	135	15827	05-Mar-85	1	0.9130	10.9660	0.6980	360.60	0.4160	70.0	0.03	12.00	7.7240	80.00	0.0300	15.00	7.8590
						15877	21-Mar-85	2	0.7400	6.1260	0.7370	337.70	0.1330	15.0	0.03	31.00	8.7070	28.00	0.0300	27.00	8.7950

TABLE #1

									FTP				4 MODE IDLE TEST				RESTART IDLE TEST			
VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	HC	CO	NOX	CO2	CH4	HC	CO	NO	CO2	HC	CO	NO	CO2
IN0/0110	JB3BD4375CT406618	1982	DODGE	CHALLENGER	156	71746	06-Apr-85	1	0.7230	10.5970	1.0370	439.20	0.1170	35.0	0.80	8.04	14.8400	35.00	1.4000	61.00	14.3470
						71858	18-Apr-85	2	0.4970	5.6560	1.1500	453.90	0.0950	45.0	0.03	116.00	12.9270	40.00	0.0400	95.00	13.4140
IN0/0113	1FABP0757D7113525	1983	FORD	ESCORT	98	40596	11-Apr-85	1	1.7820	3.7200	2.3970	321.00	0.0630	80.0	0.40	60.00	12.2610	100.00	0.4200	56.00	12.2000
						40656	17-Apr-85	2	0.8570	3.1760	2.5840	322.50	0.0630	55.0	0.23	70.00	12.6340	70.00	0.4200	70.00	12.5090
IN0/0119	1FABP944XET167569	1982	FORD	ESCORT	98	9084	19-Apr-85	1	2.2760	40.4060	1.2290	279.20	0.1180	240.0	2.50	258.00	12.5900	250.00	2.6000	32.00	13.9750
						9145	24-Apr-85	2	0.4230	3.5150	0.4740	341.40	0.1170	40.0	0.03	24.00	8.8600	38.00	0.0200	27.00	8.9380
IN0/0122	2FABP0128CX137252	1982	FORD	EXP	98	56174	24-Apr-85	1	1.9640	49.0570	0.8630	302.60	0.1780	105.0	2.60	78.00	13.3510	110.00	2.6000	81.00	13.2880
						56279	02-May-85	2	1.7250	37.2820	0.3790	300.40	0.1330	60.0	0.04	8.38	8.8130	40.00	0.0400	40.00	9.0450
						56312	08-May-85	3	1.0510	11.1010	0.6130	336.00	0.1110	30.0	0.04	38.00	8.8130	40.00	0.0400	40.00	9.0450
IN0/0123	1C3BA54D7EG255943	1984	CHRYSLER	LASER XE	135	6523	08-May-85	1	18.8900	189.0580	0.1890	280.20	1.3660	100.0	2.80	10.00	11.6430	860.00	7.5000	2.00	8.4610
						6584	24-May-85	2	0.1730	2.1500	0.9110	401.50	0.0360	8.0	0.02	4.00	11.4300	5.00	0.0200	12.00	11.6050
IN0/0125	1FABP10AXCF170215	1982	FORD	MUSTANG	140	62591	02-May-85	1	5.4940	96.8270	1.0750	288.40	0.3840	1080.0	2.45	34.00	11.3250	1130.00	2.1500	44.00	11.0700
						62675	14-May-85	2	1.0250	11.3640	0.8150	514.20	0.1610	10.0	0.03	30.00	13.9720	10.00	0.0300	30.00	14.0370
IN0/0134	1FABP0140EW239277	1984	FORD	EXP	98	23613	08-May-85	1	0.7240	5.5460	0.3760	381.10	0.2750	15.0	0.03	31.00	11.6430	20.00	0.0400	21.00	12.5560
						23673	11-May-85	2	0.6710	4.3740	0.4030	402.20	0.2400	10.0	0.02	36.00	12.5770	10.00	0.0200	36.00	12.6180
IN0/0136	JHMSR5321DS019254	1983	HONDA	CIVIC	91	37073	09-May-85	1	0.5360	2.6610	1.2530	273.30	0.0410	330.0	0.34	1.00	14.7380	375.00	0.3000	2.00	14.6500
						37139	15-May-85	2	0.5200	2.8570	1.1390	264.00	0.0380	35.0	0.04	5.00	>14.805	60.00	0.0500	30.00	14.7600
IN0/0138	J72EP61G9D6632476	1983	TOYOTA	STARLET	70	29809	16-May-85	1	0.2230	2.9470	0.5740	227.70	0.0320	150.0	0.10	1.00	>14.805	150.00	0.1200	1.00	>14.805
						29869	23-May-85	2	0.1680	2.3640	0.6250	229.80	0.0300	20.0	0.07	3.00	>14.800	25.00	0.0800	1.00	>14.805
IN0/0139	1P3BN14A6CD201632	1982	PLYMOUTH	HORIZON	105	56395	17-May-85	1	1.6670	21.9540	1.4140	276.00	0.1160	90.0	0.95	15.00	8.3560	125.00	0.7800	16.00	8.3390
						56461	23-May-85	2	1.5900	19.7210	1.7420	268.70	0.0980	130.0	0.30	15.00	8.0590	120.00	0.4000	13.00	7.8050
IN0/0140	JW1NZ0451CC432727	1982	DATSUN	TWO EIGHTY	170	47471	24-May-85	1	1.4500	9.8100	1.1570	416.50	0.1290	25.0	0.09	3.00	>14.800	30.00	0.0700	7.00	>14.800
						47541	05-Jun-85	2	1.0850	5.5460	1.5220	421.50	0.1040	20.0	0.03	18.00	14.6900	22.00	0.0400	15.00	14.6900
IN0/0141	1C3BT44G4DC163384	1983	CHRYSLER	E CLASS	160	33846	23-May-85	1	0.7390	30.6750	0.8130	409.20	0.2630	130.0	5.60	30.00	10.9020	130.00	5.6000	36.00	10.9020
						33907	30-May-85	2	0.4010	8.7190	0.7380	429.50	0.1090	15.0	0.02	71.00	14.4050	20.00	0.0200	62.00	13.5640
IN0/0144	1FABP0524C7109939	1982	FORD	ESCORT	98	52931	31-May-85	1	2.3240	40.7750	0.9180	249.20	0.1700	275.0	5.00	36.00	10.8630	265.00	4.8000	39.00	10.9800
						52992	06-Jun-85	2	0.6290	6.0400	0.8350	303.60	0.0990	20.0	0.02	34.00	8.9670	20.00	0.0200	40.00	8.7540
IN0/0145	1FABP0123CE118835	1982	FORD	EXP	98	54283	31-May-85	1	3.2160	49.8750	0.5560	298.70	0.3280	430.0	8.70	9.00	9.3820	440.00	8.6000	14.00	9.4000
						54356	07-Jun-85	2	1.3490	19.4000	0.5520	354.90	0.1140	28.0	0.05	131.00	13.3940	50.00	0.0900	82.00	14.5140
						54386	13-Jun-85	3	1.2770	9.9910	0.7120	342.40	0.1200	45.0	0.03	71.00	9.2550	45.00	0.0500	66.00	9.1830
IN0/0147	JP3BD43710Y408432	1983	PLYMOUTH	SAPPORO	156	24009	05-Jun-85	1	0.3530	5.9740	0.8860	424.70	0.1090	8.0	0.04	60.00	13.6490	10.00	0.0400	62.00	13.5050
						24070	11-Jun-85	2	0.3450	5.1420	0.8240	422.80	0.0990	10.0	0.03	44.00	11.4300	5.00	0.0300	45.00	11.7680
IN0/0151	JW1HD01510DT69875	1983	DATSUN	MAXIMA	146	28497	11-Jun-85	1	1.4970	45.0680	0.4980	399.90	0.1540	180.0	4.70	2.00	12.1510	175.00	4.6000	2.00	12.1710
						28577	19-Jun-85	2	0.9970	30.4590	0.5400	407.20	0.1180	6.0	0.03	97.00	14.5760	10.00	0.0300	96.00	14.5760
						28602	21-Jun-85	3	0.8990	28.2210	0.5740	412.40	0.1040	10.0	0.05	76.00	>14.796	8.00	0.0400	96.00	14.8120

TABLE #1

									FTP					4 MODE IDLE TEST				RESTART IDLE TEST			
VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	HC	CO	NOX	CO2	CH4	HC	CO	NO	CO2	HC	CO	NO	CO2
IM0/0154	1C3BT56G8DC263735	1983	CHRYSLER	NEW YORKER	160	41532	14-Jun-85	1	0.5560	19.8170	0.8560	471.70	0.2080	50.0	3.40	55.00	12.6010	70.00	4.4000	51.00	12.2730
						41593	20-Jun-85	2	0.3500	3.3750	0.8130	467.80	0.1080	20.0	0.03	68.00	12.2970	15.00	0.0400	69.00	12.9480
IM0/0159	JN1HT14S4CT020737	1982	DATSUN	STANZA	120	70347	25-Jun-85	1	0.5210	19.6480	0.4540	350.50	0.1400	25.0	0.04	44.00	13.9480	25.00	0.0400	51.00	13.7550
						70405	02-Jul-85	2	0.3420	15.0000	0.4330	377.50	0.1200	65.0	1.25	64.00	14.5980	90.00	0.7500	53.00	14.0980
IM0/0166	JHMS75437DS024905	1983	HONDA	CIVIC	91	46483	16-Jul-85	1	0.5300	3.4250	0.8740	288.30	0.0570	300.0	0.30	67.00	>14.800	320.00	0.7000	78.00	14.4920
						46586	19-Jul-85	2	0.3310	1.9220	0.8720	287.50	0.0440	235.0	0.08	33.00	>14.800	230.00	0.0700	33.00	>14.800
IM0/0168	1MEBP60245ET61771	1984	MERCURY	LYNX	98	17931	17-Jul-85	1	2.1340	52.7470	0.2920	310.20	0.1190	180.0	3.00	41.00	12.7870	180.00	3.1000	25.00	12.7450
						17996	31-Jul-85	2	0.4170	5.0860	0.5890	344.50	0.1040	18.0	0.03	34.00	9.6380	20.00	0.0300	26.00	9.5090
IM0/0170	JN1PB04S4C9285552	1982	DATSUN	TWO-TEN	90	40935	18-Jul-85	1	1.2880	19.9960	0.4550	305.10	0.3770	610.0	9.60	12.00	7.7040	690.00	9.7000	11.00	7.7210
						41027	27-Jul-85	2	0.3390	3.0570	0.4880	311.90	0.0980	30.0	0.05	56.00	12.2320	22.00	0.0400	55.00	12.3950
IM0/0171	2MEBP6449CI643455	1982	MERCURY	LYNX	98	52310	24-Jul-85	1	2.8540	48.2500	0.6430	286.00	0.1690	280.0	3.30	63.00	12.5800	260.00	3.0000	66.00	12.5590
						52372	01-Aug-85	2	0.6690	8.3220	0.4990	367.10	0.1730	40.0	0.03	20.00	9.2190	45.00	0.0200	20.00	>14.800
IM0/0178	JN1CI04SIDX752190	1983	DATSUN	TWO-EIGHTY	168	52420	06-Aug-85	1	1.0760	6.5000	1.4080	416.80	0.0940	12.0	0.04	5.00	>14.800	14.00	0.0400	2.00	>14.800
						52488	16-Aug-85	2	0.9990	5.3390	1.1620	424.20	0.0880	30.0	0.08	1.00	>14.805	20.00	0.0300	1.00	>14.805
IM0/0181	JF1AF21B9CA110564	1982	SUBARU	HATCHBACK	97	48373	08-Aug-85	1	0.5290	4.6150	1.3450	281.50	0.0640	270.0	0.20	4.00	14.5800	350.00	0.2000	3.00	>14.800
						48454	15-Aug-85	2	0.2650	3.6490	1.0840	277.50	0.0390	250.0	0.15	1.00	14.6940	220.00	0.1000	4.00	>14.805
IM0/0183	1FABP0442ET173616	1984	FORD	ESCORT	98	17513	08-Aug-85	1	1.3380	4.3730	0.5260	391.40	0.3150	25.0	0.04	34.00	13.1410	30.00	0.1800	4.00	14.4920
						17578	20-Aug-85	2	1.2650	4.8890	0.7170	399.60	0.2840	10.0	0.03	41.00	12.4950	15.00	0.0300	34.00	13.8430
IM0/0184	1FABP0420DW207609	1983	FORD	ESCORT	98	58890	16-Aug-85	1	0.5630	8.9390	0.5180	347.20	0.1560	50.0	0.04	47.00	11.0310	50.00	0.0400	46.00	10.8750
						58951	21-Aug-85	2	0.5480	8.6880	0.5020	349.80	0.1530	45.0	0.03	46.00	10.6820	50.00	0.0300	50.00	11.1090
IM0/0186	1FABP0141EW339429	1984	FORD	EXP	98	29769	27-Aug-85	1	0.7280	6.3510	0.7700	353.20	0.1570	40.0	0.02	36.00	10.4140	40.00	0.0100	36.00	10.1680
						29845	04-Sep-85	2	0.7160	7.4380	0.7280	345.30	0.1390	25.0	0.01	33.00	9.7560	30.00	0.0100	33.00	9.8310
IM0/0190	1VWBB0175CV035264	1982	VOLKSWAGEN	RABBIT	106	56762	29-Aug-85	1	0.4930	7.3950	2.9640	298.00	0.0520	160.0	4.20	2.00	12.0450	170.00	3.9000	3.00	12.1060
						56835	05-Sep-85	2	0.1930	0.4050	1.8920	307.00	0.0180	55.0	0.02	110.00	14.1890	50.00	0.0200	119.00	14.3200
IM0/0191	JF3B34F0EU400392	1984	PLYMOUTH	COLT	98	34351	06-Sep-85	1	2.5000	8.8860	0.2390	293.90	0.1070	1500.0	0.05	58.00	13.9720	1330.00	0.8000	19.00	14.3860
	No second sequence																				
IM0/0195	2FABP052CE229658	1982	FORD	ESCORT	98	91873	10-Sep-85	1	2.3440	79.8770	0.8000	231.50	0.2260	280.0	5.15	53.00	10.8830	270.00	4.9000	59.00	11.0570
						91933	21-Sep-85	2	1.0180	33.5470	0.2810	357.80	0.3090	65.0	1.30	21.00	11.5890	70.00	1.3000	24.00	11.6280
IM0/0196	1B3A44D6EG281408	1984	DODGE	DAYTONA	135	31427	11-Sep-85	1	5.9540	115.5130	0.7000	309.40	0.8030	520.0	7.40	11.00	8.9320	580.00	7.3000	14.00	9.0210
						31503	19-Sep-85	2	0.4270	3.9490	1.6050	385.40	0.0670	20.0	0.02	25.00	11.1160	20.00	0.0300	22.00	11.0960
IM0/0200	1FABP0529CT135534	1982	FORD	ESCORT	98	56651	17-Sep-85	1	0.8320	13.3580	0.5190	357.50	0.1820	95.0	1.30	33.00	10.6520	90.00	1.3500	36.00	9.6010
						56725	21-Sep-85	2	1.0370	12.6190	0.6080	349.50	0.1210	30.0	0.01	38.00	9.4560	40.00	0.0200	38.00	9.6010
IM0/0202	1B3A44D9EG206170	1984	DODGE	DAYTONA	135	35570	18-Sep-85	1	4.6960	123.4260	0.7090	309.10	0.6430	340.0	3.20	19.00	10.1960	860.00	7.4000	9.00	7.4890

TABLE #1

								FTP					4 MODE IDLE TEST				RESTART IDLE TEST			
VEHICLE #	VIN	M. YEAR	MAKE	MODEL	DISPL	ODOMETER	TEST DATE	SEQ	HC	CO	NOX	CO2	CH4	HC	CO	NO	CO2	HC	CO	NO	CO2
						36635	20-Sep-85	2	1.1130	3.7300	3.0310	399.60	0.0730	55.0	0.03	35.00	11.7480	60.00	0.0300	37.00	11.4100

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Table of Vehicle Repair Information

TABLE #2

VEHICLE #	MT. SEQ	REPAIR TIME	PARTS COST CONV	PARTS COST 3-WAY	REPAIR
IM5/0002	2	1:19	$0.00	$0.00	REMOVE IDLE MIXTURE PLUG AND SET DWELL TO SPEC OF 30
IM5/0005	2	2:30	$45.00	$375.00	REPLACE PCV HOSE (KINKED SHUT); INSTALL NEW EFE/CANISTER PURGE TEMP SWITCH; CORRECTLY ROUTE CANISTER PURGE AND EFE HOSES; REPLACE #2 SPARK PLUG; INSTALL NEW ECM AND MIXTURE SOLENOID; "CHECK" BULB; REPLACED THROTTLE POSITION SENSOR; SET ISC TO SPEC. NOTE: EGR VALVE STUCK OPEN/CLOSED; CANISTER SATURATED WITH FUEL.
IM5/0006	2	2:00	$0.00	$550.00	INSTALL NEW ECM AND TPS SENSOR. INSTALL NEW O2 SENSOR. REMOVE MIXTURE PLUG AND CENTER DWELL
IM5/0009	2	2:00	$0.00	$50.00	REPLACE UPSTREAM CHECK VALVE AND PIPE ASSEMBLY.
IM5/0012	2	1:00	$0.00	$80.00	SET FAST IDLE, CURB IDLE, TIMING, AND IDLE MIXTURE DWELL TO SPEC. REPLACE PULSE AIR SHUT OFF SOLENOID. RECONNECT PULSE AIR HOSE TO AIR CLEANER. NOTE, EGR VALVE IS BROKEN.
IM5/0013	2	15:00	$0.00	$450.00	INSTALL NEW ECM; TROUBLE CODES 23, 41, 51, AND 54 PRESENT. INSTALL NEW PROM, MIXTURE SCREW AND SET MIXTURE.
	3	1:00	$0.00	$50.00	REPLACED O2 SENSOR.
IM5/0015	2	0:30	$0.00	$0.00	SET MIXTURE SOLENOID DWELL TO CENTER OF BAND 30'
IM5/0018	2	WARR	WARR	WARR	REPLACED O2 SENSOR; UPSTRAM CHECK VALVE; THROTTLE SPRING. (DECARBON ENGINE FROM RICH CONDITION.)
	3	1:00	$0.00	$0.00	RESET ISC MOTOR WITH WITH CRUISE CONTROL DISCONNECTED-IDLE SPEED WAS HANGING UP CAUSING CAR TO RUN TOO RICH.
IM5/0019	2	2:30	$0.00	$390.00	INSTALL NEW ECM; PROM; AND TPS SENSOR.
IM5/0022	2	2:00	$0.00	$30.00	REPLACE O2 SENSOR; REMOVE IDLE BLEED COVER AND SET DWELL. (NOTE: CAT MAY BE MARGINAL; CANISTER FILTER IS DIRTY.)
	3	1:30	$0.00	$310.00	REPLACE ECM.
IM5/0023	2	1:30	$0.00	$0.00	SET CARBURATOR PARAMETERS. PROBLEM CANNOT BE PINPOINTED.
IM5/0027	2	1:00	$0.00	$35.00	REPLACE O2 SENSOR.
IM5/0028	2	0:30	$0.00	$0.00	INSTALL NEW PCV HOSE. SET MIXTURE DWELL.

TABLE #2

VEHICLE #	MT. SEQ	REPAIR TIME	PARTS COST CONV	PARTS COST 3-WAY	REPAIR
IM5/0029	2	4:00	$0.00	$350.00	INSTALL NEW CHECK VALVE, EGR VALVE, TPS SENSOR, O2 SENSOR, MIXTURE SOLENIOD, AND IDLE AIR BLEED. SET TIMING TO SPEC.
	3	2:00	$0.00	$250.00	INSTALL NEW CATALYST
IM5/0030	2	0:30	$0.00	$0.00	SET IDLE MIXTURE USING AIR BLEED SCREW.
IM5/0033	2	0:30	$0.00	$0.00	SET DWELL TO 35' USING MIXTURE SCREW.
IM5/0037	2	1:00	$0.00	$0.00	SET TIMING AND IDLE TO SPEC; CLEAN DISTRIBUTOR CAP.
IM5/0038	2	2:45	$0.00	$0.00	CLEAN IDLE AIR BLEED. REMOVE MIXTURE PLUG AND SET DWELL TO LOWER END OF SPEC.
IM5/0040	2	0:30	$0.00	$0.00	REPLACE VACUUM HOSE GOING TO VACUUM BREAK. SET IDLE TO SPEED TO SPEC.
IM5/0041	2	1:00	$0.00	$0.00	SET IDLE AIR BLEED ADJUSTMENT.
IM5/0044	2	0:30	$0.00	$0.00	SET IDLE MIXTURE AND IDLE SPEED TO SPEC.
IM5/0048	2	2:00	$16.00	$54.00	REPLACE AIR FILTER, AIR PUMP CHECK VALVE, PCV FILTER AND O2 SENSOR.
IM5/0049	2	1:00	$12.00	$0.00	REPLACE AIR AND CANISTER FILTERS.
IM5/0052	2	6:00	$100.00	$700.00	REPLACE CHECK VALVE, AIR FILTER, PCV FILTER, 8 SPARK PLUGS, CARBURATOR, O2 SENSOR, CANISTER FILTER, PCV VALVE, OIL, OIL FILTER, 2 SPARK PLUG WIRES.
IM6/0001	2	0:30	$0.00	$0.00	SET CARB IDLE, ADJUST IDLE CO TO 1.5%.
IM6/0004	2	2:00	$150.00	$0.00	INSTALL NEW AIR PUMP AND BELT; TIGHTLY CLAMP UPSTREAM AIR HOSES; CLEANED CHOKE AREA.
IM6/0007	2	0:30	$0.00	$260.00	INSTALL NEW HCV UNIT.
IM6/0008	2	0:30	$0.00	$150.00	INSTALL NEW O2 SENSOR AND AIR FILTER.
IM6/0014	2	0:30	$0.00	$0.00	RECONNECT EGR.
IM6/0036	2	1:00	$0.00	$140.00	REPLACE O2 SENSOR AND ALL SPARK PLUG WIRES; REPAIR FRESH AIR TUBE. SET CURB IDLE TO SPEC.

TABLE #2

VEHICLE #	MT. SEQ	REPAIR TIME	PARTS COST CONV	PARTS COST 3-WAY	REPAIR
	3	0:30	$0.00	$0.00	SET CURB IDLE TO SPEC.; REPAIR LEAK IN DIVERTER VALVE HOSE.
IM6/0039	2	0:30	$0.00	$0.00	SET IDLE SPEED AND TIMING TO SPEC.
IM6/0042					NO SECOND SEQUENCE.
IM6/0043	2	1:00	$0.00	$250.00	REPLACE CARBURETOR.
IM6/0045	1	1:30	$110.00	$0.00	REPLACE MUFFLER AND EXTENSION PIPE.
	2	1:00	$0.00	$0.00	SET TIMING AND IDLE TO SPEC; RECONNECT O2 SENSOR WIRE.
IM6/0046	2	2:00	$50.00	$215.00	REPLACE ELECTRONIC CONTROL UNIT, PCV VALVE AND FILTER, O2 SENSOR, AND AIR MANAGEMENT VALVE.
IM6/0051	2	0:10	$0.00	$0.00	ADJUST IDLE SPEED TO SPEC.
IM6/0053	2	1:00	$0.00	$0.00	ADJUST IDLE MIXTURE TO SPEC.
IM6/0054	1	1:00	$50.00	$0.00	INSTALL NEW IDLE MIXTURE LIMITING DEVICE.
	2	0:15	$1.00	$0.00	SET IDLE TO SPEC. REPAIR VACUUM HOSE.
IM6/0056	2	1:30	$12.00	$0.00	REPLACE PULSE AIR FILTERS. ADJUST TIMING, IDLE MIXTURE, AND IDLE SPEED TO SPEC.
IM6/0057	2	2:00	$130.00	$0.00	SET IDLE SPEC TO SPEC. REPLACE BRAKE BOOSTER.
IM7/0101	2	1:30	$0.00	$41.00	REPLACE CHECK VALVE, UPSTREAM AIR PIPE, AND O2 SENSOR.
	3	1:30	$250.00	$0.00	INSTALL NEW CATALYST.
IM7/0102	2	1:30	$37.00	$0.00	REPLACE EGR VALVE; WITH CAR IN DRIVE, CENTER ISC MOTOR TO MIDDLE OF SPEC
IM7/0105	2	0:20	$0.00	$35.00	INSTALL NEW O2 SENSOR.
IM7/0107	2	0:20	$19.00	$0.00	ADJUST CARB IDLE TO SPEC; INSTALL NEW AIR FILTER.
IM7/0108	2	0:30	$0.00	$0.00	SET CURB IDLE TO SPEC.
IM7/0109	2	0:30	$0.00	$45.00	INSTALL NEW O2 SENSOR.

TABLE #2

VEHICLE #	MT. SEQ	REPAIR TIME	PARTS COST CONV	PARTS COST 3-WAY	REPAIR
IM7/0114					NO SECOND SEQUENCE.
IM7/0115	2	0:30	$0.00	$0.00	REMOVE BB FROM AIR MANAGEMENT VALVE.
IM7/0117	2	0:30	$0.00	$0.00	REPAIR BOOT ON #1 SPARK PLUG WIRE; REINSTALL WIRE.
IM7/0124	2	1:00	$0.00	$40.00	INSTALL NEW O2 SENSOR. REPLACE RADIATOR CAP.
IM7/0131	2	1:30	$0.00	$260.00	INSTALL NEW ECM. SET TIMING TO SPEC.
IM7/0135	2	0:30	$0.00	$0.00	RECONNECT PORTED SIGNAL HOSE AT 3-WAY TEE.
IM7/0137	2	4:00	$60.00	$30.00	OVERHAUL CARB. REPLACE VACUUM BREAK AND O2 SENSOR.
IM7/0143	1	0:30	$0.00	$35.00	REPLACED O2 SENSOR. REPLACED MUFFLER AND TAILPIPE.
	2	2:00	$80.00	$0.00	REPLACED MUFFLER AND TAILPIPE.
IM7/0150	2	1:00	$0.00	$44.00	INSTALL NEW TPS SENSOR.
IM7/0153	2	1:00	$0.00	$0.00	SET CARB MIXTURE SCREWS AND SET DWELL. ADD 1 CAN OF GM TOP ENGINE CLEANER TO DECARBONIZE MOTOR.
	3	1:00	$0.00	$275.00	INSTALL NEW ECM.
IM7/0164	2	0:30	$0.00	$0.00	RECONNECT HOSE TO VACUUM BREAK; RECONNECT HOSE TO HOT AIR DOOR. REMOVE PLUG AND SET MIXTURE DWELL.
IM7/0167					NO SECOND SEQUENCE.
IM7/0169	2	3:00	$0.00	$275.00	INSTALL NEW ECM, O2 SENSOR, AND AIR FILTER.
IM7/0172	2	2:00	$88.00	$0.00	REPLACE CHECK VALVE AND TUBES.
	3	1:00	$0.00	$0.00	SET CARB PARAMETERS TO SPEC USING MIXTURE SCREWS AND IDLE AIR BLEED.
IM7/0201					NO SECOND SEQUENCE.
IM8/0103	2	1:15	$0.00	$0.00	CLEAN CHOKE AREA OF CARB. SET IDLE MIXTURE; SET CURB IDLE TO 800.
IM8/0110	2	1:30	$95.00	$0.00	INSTALL NEW COIL, COIL WIRE, DISTRIBUTOR CAP, ROTOR, SPARK PLUG WIRE.

TABLE #2

VEHICLE #	MT. SEQ	REPAIR TIME	PARTS COST CONV	PARTS COST 3-WAY	REPAIR
					REMOVE IDLE MIXTURE PLUG AND SET CO.
IM8/0113	2	0:30	$10.00	$0.00	REPLACE BROKEN #3 SPARK PLUG WIRE.
IM8/0119	2	0:30	$0.00	$0.00	RECONNECT EGR HOSE; REPAIR VACUUM LINE TO DUMP VALVE.
IM8/0122	2	1:30	$10.00	$0.00	REPAIR VACUUM SIGNAL HOSES TO EGR SYSTEM, AIR MANAGEMENT SYSTEM, CANISTER PURPE SYSTEM , AND VACUUM ADVANCE. SET CURB IDLE TO SPEC.
	3	0:30	$0.00	$0.00	REPAIR SMALL LEAK AT TVS UNDER INTAKE MANIFOLD.
IM8/0123	2	1:00	WARR	WARR	INSTALL NEW O2 SENSOR.
IM8/0125	2	1:30	$10.00	$0.00	SET TIMING AND IDLE PARAMETERS TO SPEC. INSTALL AIR PUMP BELT AND TIGHTEN CHECK VALVE CONNECTION.
IM8/0134	2	0:30	$0.00	$0.00	SET CURB IDLE TO SPEC.
IM8/0136	2	0:30	$0.00	$0.00	SET CURB IDLE TO SPEC.
IM8/0138	2	0:30	$0.00	$0.00	SET IDLE SPEED TO SPEC.
IM8/0139	2	1:00	$0.00	$0.00	SET TIMING TO SPEC; REMOVE MIXTURE PLUG AND SET MIXTURE.
IM8/0140	1	2:00	$100.00	$0.00	REPLACE MUFFLER DUE TO EXHAUST LEAK.
	2	0:30	$0.00	$120.00	INSTALL NEW O2 SENSOR.
IM8/0141	2	0:30	$0.00	$0.00	SET IDLE MIXTURE.
IM8/0144	2	1:30	$0.00	$10.00	REPLACE TVS FOR AIR SYSTEM. REMOVE MIXTURE PLUG AND SET MIXTURE.
IM8/0145	2	1:00	$0.00	$0.00	SET IDLE SPEED AND MIXTURE. RECONNECT HOSE TO VOTH AND TO AIR CLEANER TEMPERATURE SENSOR.
	3	1:30	$0.00	$35.00	REPLACE AIR SWITCHING TVS.
IM8/0147	2	0:30	$0.00	$0.00	SET IDLE SPEED TO SPEC.
IM8/0151	2	0:30	$0.00	$0.00	SET IDLE MIXTURE.
	3	0:30	$0.00	$110.00	INSTALL NEW O2 SENSOR.

TABLE #2

VEHICLE #	MT. SEQ	REPAIR TIME	PARTS COST CONV	PARTS COST 3-WAY	REPAIR
IM8/0154	2	0:30	$0.00	$0.00	RECONNECT BOWL VENT HOSE. SET IDLE MIXTURE.
IM8/0159	2	1:00	$15.00	$0.00	INSTALL NEW AIR FILTER AND PULSE AIR FILTER; ADJUST IDLE SPEED.
IM8/0166	2	0:30	$20.00	$0.00	INSTALL NEW AIR FILTER AND DISTRIBUTOR CAP; ADJUST IDLE SPEED.
IM8/0168	2	2:00	$0.00	$0.00	SET IDLE MIXTURE TO SPEC.
IM8/0170	2	2:00	$10.00	$0.00	SET TIMING, IDLE SPEED, AND IDLE CO TO SPEC; INSTALL SPARK PLUGS.
IM8/0171	2	1:00	$0.00	$0.00	REPAIR HOSES. SET IDLE SPEED AND TIMING TO SPEC.
IM8/0178	2	2:00	$0.00	$125.00	INSTALL NEW O2 SENSOR
IM8/0181	2	1:00	$0.00	$0.00	SET IDLE MIXTUE AND IDLE SPEED.
IM8/0183	2	0:30	$0.00	$0.00	SET IDLE SPEED TO SPEC.
IM8/0184	1	2:00	$125.00	$0.00	REPLACE EXHAUST PIPE, TAILPIPE, AND MUFFLER.
	2	0:10	$0.00	$0.00	ADJUST IDLE SPEED TO SPEC.
IM8/0186	2	1:10	$8.00	$0.00	REPLACE AIR FILTER ELEMENT. SET IDLE MIXTURE AND IDLE SPEED TO SPEC.
IM8/0190	2	1:00	$0.00	$0.00	SET IDLE MIXTURE AND IDLE SPEED TO SPEC.
IM8/0191					NO SECOND SEQUENCE.
IM8/0195	2	2:00	$60.00	$0.00	REPLACE AIR MANAGEMENT VALVE. SET TIMING AND IDLE SPEED TO SPEC.
IM8/0196	2	1:00	$0.00	$30.00	REPLACE O2 SENSOR.
IM8/0200	2	2:00	$0.00	$0.00	REMOVE IDLE MIXTURE ADJUSTMENT LIMITER PLUG AND SET IDLE MIXTURE TO SPEC
IM8/0202	2	1:00	$0.00	$30.00	REPLACE O2 SENSOR.

Table of Summary of Vehicle Rejection

and

Table of Summary of Vehicle Rejection After First FTP

TABLE NO. 3

SUMMARY OF REJECTION REASONS		
REASON FOR REJECTION	Model Year 1981	1982+
Failed to meet idle criteria (HC $\geq$ 120 ppm or CO $\geq$ 0.7), and no computer problem codes	12	39
Extensive non-emission related work (on engine, transmission, or turbo) was required	2	5
Driveability (i.e., unsafe on dyno)	3	2
Vehicle was extensively modified	0	1
Vehicle was an LDT	1	1
Already partially repaired	0	1
Time ran out on this task	0	1

TABLE NO. 4

SUMMARY OF REJECTION REASONS AFTER FIRST FTP	
VEHICLE NO.	REASON FOR REJECTION
IM6/0017	Vehicle required major engine repairs (approximately $2000.00) - rings and valve job.
IM6/0042	Vehicle required major engine repairs - rings.
IM7/0114	Non-OE Air Conditioner made maintenance impossible
IM7/0167	Vehicle required major engine repairs - #3 valve guide bad, bad valve cylinders
IM8/0191	Vehicle requires major engine repairs (approximately $1600.00)-turbocharging seals leak, allowing oil to pass into turbo cavity